THE PROBLEM OF THE SOULS OF THE SPHERES

FROM THE BYZANTINE COMMENTARIES ON ARISTOTLE THROUGH THE ARABS AND ST. THOMAS TO KEPLER

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KEPLER, who, as we all know, lived under the new heaven created by Copernicus, discusses the question whether the planets are moved by Intelligences or by souls or by nature.[1] His consideration of Intelligences as possible movers of the planets refers to a view held by those who in the Middle Ages lived under the old Ptolemaic heaven, the term Intelligences being, by a complexity of miscegenation, a descendant of what Aristotle describes as incorporeal substances. His consideration of souls or nature as possible movers of the planets touches upon a topic which was made into a problem by the Byzantine Greek commentators of Aristotle.

In this paper I shall try to show how the Byzantine commentators, in their study of the text of Aristotle, were confronted with a certain problem, how they solved that problem, and how their solution of that problem led to other problems and solutions, all of which lingered in philosophic literature down to Kepler.

I

In Aristotle, a distinction is made between external and internal movers of the celestial bodies. The terms external and internal are used here for what Aristotle would have designated by the terms "separate" (χωριστά) and "inseparate" (οὐ χωριστά), that is, "incorporeal" and "corporeal," or for what those of us who like to use more fashionable terms would call "transcendent" and "immanent."

Of these two kinds of movers, the external ones are directly dealt with by Aristotle in his discussion of the substances which move the spheres in *Metaphysics* XII, 8. They are said by him to be of the same kind as that first substance, called mind,[2] which in the preceding chapter is described by him as "eternal and immovable and separate (κεχωρισμένη) from sensible things."[3] Like that first substance, which has been described by him in the preceding chapter as producing motion as a final cause,[4] these substances too may be assumed to produce motion as final causes. But, unlike the first substance, which is said by him to be immovable both essentially and accidentally, these substances, Aristotle intimates, are immovable only essentially but are movable accidentally.[5] The accidental motion which he attributes to these substances is, however, of a special kind. As explained by him in the *Physics*,[6] it is unlike the accidental motion of the souls of animal beings. The souls of animal beings are moved accidentally by the very motions which they produce in their respective

[1] Cf. *infra*, at notes 177, 193, 194, 195.
[2] *Metaph.* XII, 8, 1073a, 14.
[3] *Ibid.* XII, 7, 1073a, 3–5.
[4] *Ibid.*, 1072b, 1 ff.
[5] *Ibid.* XII, 8, 1073a, 23–25, 26–27, 31–34. Cf. my paper "The Plurality of Immovable Movers in Aristotle and Averroes," *Harvard Studies in Classical Philology*, 63 (1958), p. 238.
[6] *Phys.* VIII, 6, 259b, 28–31.

spheres; whereas these substances are moved accidentally not by the motions which they themselves produce in their respective spheres but rather by the motions which are produced in those spheres by the first sphere.[7]

With regard to the inner movers of the spheres, however, the Byzantine commentators found in Aristotle two sets of contradictory statements.

In *De Caelo* I, 2, they found that Aristotle, after starting with the statement that "bodies are either simple or compounded; and by simple bodies I mean those which possess a principle of motion in their own nature, such as fire and earth and the species of these, and whatever is akin to them,"[8] leads up to the conclusion that "there must necessarily be some simple body which revolves naturally and in virtue of its own nature with a circular motion."[9] Commenting upon Aristotle's statement about simple bodies, Simplicius says that the expression "simple bodies" is used by Aristotle in contradistinction to "animals," for, while both simple bodies and animals possess a principle of motion, that of the former is "according to nature alone" whereas that of the latter is "according to soul"[10] and, commenting further upon the statement "and whatever is akin to them," he quotes with approval Alexander's interpretation that Aristotle means by it the other two elements "fire" and "air" and also "the fifth body," that is, the celestial element, for the fifth body, Alexander remarks, "is also a natural body."[11] Thus, according to Aristotle in these statements, the circular motion of the celestial bodies, like the rectilinear motion of the sublunar elements, is not by soul but by nature.

Similarly in *De Caelo* II, 1, after rejecting various explanations for the eternity of the motion of the heaven, Aristotle says, "Nor, again, is it conceivable that it should persist eternally by the necessitation of a soul."[12]

Yet in several other places Aristotle explicitly says that the celestial bodies are living beings and hence possess a soul. Thus, in one place he says that "the heaven is animate (ἔμψυχος) and possesses a principle of life."[13] In another place he says that "in dependence upon the heaven all other things have their existence and their life, some more directly, others more obscurely,"[14] which, of course, implies that the heaven itself possesses life. In two other passages, speaking of the stars, which the commentators assume not to differ from the spheres in the nature of their motion, Aristotle says: "We," that is to say, we philosophers, "have been thinking of the stars as mere bodies, and as units which possess an order indeed, but are entirely inanimate. We ought, however, to consider them as partaking of action and life"[15] and also that "we must then think of the action of the stars as similar to that of animals and plants."[16]

[7] *Art. cit.* (*supra*, note 5), p. 237.
[8] *De Caelo* I, 2, 268b, 27–29.
[9] *Ibid.*, 269a, 5–7.
[10] *Simplicius in De Caelo* I, 2, ed. I. L. Heiberg (1884), p. 16, lines 11–14.
[11] *Ibid.*, lines 21–26.
[12] *De Caelo* II, 1, 284a, 27–28.
[13] *Ibid.* II, 2, 285a, 29–30.
[14] *Ibid.* I, 9, 279a, 28–30.
[15] *Ibid.* II, 12, 292a, 20–21.
[16] *Ibid.*, 292b, 1–2.

And so the Byzantine commentators were confronted with two sets of contradictory statements. This gave rise to two interpretations among them.

One interpretation, which is quoted by Simplicius, reads as follows: "Some philosophers who are revered by me think that the heaven is said by Aristotle to be animate (ἔμψυχον) only in the sense that it has life congenital (σύμφυτον) with its body, according to which it has a principle of motion, but not in the sense that it has a rational soul (λογικὴν ψυχήν)."[17]

This passage makes two assertions. First, it asserts that Aristotle's description of the heaven as "animate" should not be taken literally as meaning that, like an animal, the heaven has a soul distinct from its body. It means only that, like an animal, it is moved by a principle of motion which is within itself, but that inner principle of motion is the nature of the body itself, to which life and motion are congenital. Second, it asserts that this denial to the heaven of a soul distinct from its body means not only the denial of a motive soul but also the denial of a rational soul.

Of these two assertions, the first would seem to be only the rephrasing of a statement by Alexander, to be quoted later, that in the case of the heaven "nature is the same as soul."[18] The second assertion, however, does not represent the view of Alexander, for, as we shall see later, while Alexander indeed maintains that the soul of the heaven is the same as its nature and while to that soul, which is the same as nature, he denies a nutritive and sensitive faculty, he does not deny to it a rational faculty; he maintains only that the rational soul of the heaven, like the rational soul of all living beings, is not something distinct from, and other than, the body, but rather a function of the nature of the body of rational living beings.[19] Furthermore, Simplicius usually quotes Alexander by name, and it would therefore seem strange that he should conceal here the identity of Alexander under the vague and general term "some philosophers."

Who, then, were those philosophers revered by Simplicius who specifically denied that heaven had a rational soul?

Let us assemble all those who before Simplicius denied that the heaven had either a soul in general or a rational soul in particular and see whether it was they, all or some of them, that Simplicius could be referring to here.

First, there is Anaxagoras, who is said to have been "indicted by Cleon on a charge of impiety, because he declared the sun to be a mass of red-hot metal,"[20] which, as we may gather from Augustine, means that he declared that the sun, and for that matter any the other heavenly body, was "neither a god nor even a living body."[21]

Second, there are those anonymous philosophers who are hinted at by Philo when, in the course of his attempt to prove the limitation of human reason by the fact that philosophers are in disagreement among themselves, he

[17] *Simplicius in De Caelo* II, 2, p. 388, lines 16–19.
[18] Cf. *infra*, at note 46.
[19] Cf. *infra*, the concluding paragraph after note 64, and notes 80–83.
[20] Diogenes Laërtius, II, 12; cf. Plutarch, *Pericles* 32; *Nicias*, 23.
[21] Augustine, *De Civ. Dei* XVIII, 41.

raises the following question: "Are the stars animate and intelligent, or are they devoid of intelligence and soul?"[22] This evidently shows that Philo had knowledge of certain philosophers who denied that the stars had a rational soul.

Third, there are Democritus and Epicurus. A fragmentary statement in the *De Placitis Philosophorum*, which was completed by modern scholars, reads: "Democritus and Epicurus say that the heavens [are irrational]."[23]

Fourth, there is Basil, who argues that "the heavens are not alive ... nor the firmament a sensible animal," and from the context it may be further inferred that, like the waters above the heaven, they are not "intelligent beings."[24]

Fifth and finally, there is John Philoponus, a contemporary of Simplicius and often quoted by him, who, speaking not as a philosopher in one of his commentaries on Aristotle but rather as a Christian in a theological work, denies that the heaven is moved by a soul or even by angels.[25] The denial of "a soul" is in opposition to those Aristotelian commentators who, as we shall see, attributed a soul to the heaven; his denial of "angels," however, is in opposition to at least two Christian theologians who described angels as movers of the celestial bodies. Thus Theodore of Mopsuestia, commenting on the verse, "For by Him were all things created, that are in heaven, and that are in earth, visible and invisible, whether they be thrones, or dominions, or principalities, or powers" (Col. 1:16), says that "some of them command the air, some the sun, some the moon, some the stars, and some some others, in order that they may move all things in accordance with the task imposed upon them by God, to the end that things may exist together."[26] Similarly Cosmas in his comment on the verse, "[Wherein in time past you walked according to the course of this world], according to the prince of the power of the air, the spirit that now worketh in the children of disobedience" (Eph. 2:2), says that "some of the angels were commissioned to move the air, some the sun, some the moon, and some the stars."[27]

These, however, whether all or some of them, could not be those whom Simplicius meant by "the philosophers" who were "revered" by him, for the revered philosophers referred to by him were interpreters of Aristotle, whereas all those I have quoted expressed their own opinion. John Philoponus, in addition, would not have been described as "revered" by him. Among interpreters of Aristotle prior to Simplicius, there was none, as far as I know, who explicitly denied that the celestial bodies had a rational soul. I should like to suggest that the philosophers quoted here by Simplicius were associates of his in the school of Athens during the last years of its existence in the sixth century, prior to its being closed by the order of Justinian in 529. Probably these philosophers quoted by Simplicius started as followers of Alexander's interpretation of

[22] *De Somniis* I, 4, 22.

[23] Cf. Diels, *Doxographi Graeci*[2], V, 20, 2, p. 432a, lines 9–10, and Diels' note *ad loc.*

[24] *Hexaemeron*, hom. III, 9 (PG 29, 76 A); cf. John of Damascus, *De Fid. Orth.* II, 6 (PG 94, 885 AB).

[25] *De Opificio Mundi* VI, 2, ed. G. Reichhardt (1897), pp. 28, 17ff., 231, 11. 3ff.

[26] *Theodori Mopsuesteni in Epistolas B. Pauli Commentarii*, ed. H. B. Swete, I (1880), pp. 270–271. "Theodoros" is mentioned by Philoponus himself in *op. cit.*, p. 28, line 20.

[27] *The Christian Topography of Cosmas Indicopleustes*, ed. E. O. Winstedt (1909), 117 D; cf. 152 D, 301 C; 405 D, 429 A. For this reference to Cosmas I am indebted to Prof. Milton V. Anastos.

Aristotle, but then, either unconsciously misunderstanding the real meaning of Alexander's interpretation or consciously departing from it, they attributed to Aristotle the view of directly denying that the heaven had a "rational soul." Hence, according to this interpretation, the true view of Aristotle was contained in the statements that speak of the heaven as being moved by nature; the passages that speak of the heaven as being animate were to be explained in the same spirit.

The other interpretation is that which takes the passages speaking of the heaven as animate to represent the true view of Aristotle. This interpretation is advanced by Simplicius himself in his criticism of those anonymous revered philosophers whom he has quoted. In his criticism, he starts out by saying, "I think I have a right to ask them, in the first place, to take into consideration the fact that Aristotle has said that some things are animate and others natural."[28] This reference by Simplicius to what Aristotle had said was not meant by him to be a verbal quotation, but rather a general reference to Aristotle's distinction between things that have a soul and things that have no soul, which may be gathered from many places in his writings. Then quoting the passage about the stars, reproduced *supra*,[29] he shows that Aristotle himself has rejected the view that stars are "entirely inanimate" (ἀψύχων πάμπαν), maintaining that we ought to consider them as "participating of action and life," upon which he himself remarks that "to act, according to Aristotle, belongs to the rational soul."[30]

Thus, according to Simplicius' interpretation of Aristotle, the celestial bodies have a rational soul. This interpretation has its precedents in the Greek commentaries on Aristotle.

The earliest occurrence of this interpretation is in Theophrastus' lost treatise *On the Heaven*, which is reported by Proclus in his commentary on the *Timaeus* (35 A) as follows: "For he grants that the heaven is animate and on this account divine. For, if it is divine, he says, and has the most excellent manner of being, it is animate, since nothing is esteemed honorable without a soul, as he writes in his treatise *On the Heaven* (περὶ οὐρανοῦ)."[31]

But if this represents Theophrastus' final view on the subject, he must have arrived at it after the composition of his *Metaphysics*, for in the *Metaphysics*,[32] in the course of his discussion of Aristotle's view that the Prime Mover moves the celestial spheres as an object of appetite or desire (τὸ ὀρεκτικὸν),[33] he argues against this view on account of its implication that celestial bodies possess appetence or desire, for which he uses the Greek terms ὄρεξις and ἔφεσις indiscriminately.[34] He starts his argument as follows: "And if appetence or

[28] *Simplicius in De Caelo* II, 2, p. 388, lines 19–20.

[29] *De Caelo* II, 12, 292a, 19–21.

[30] *Simplicius in De Caelo* II, 2, p. 388, lines 20–25.

[31] *Procli commentarius in Platonis Timaeum*, ed. C. E. Chr. Schneider (1847), p. 418 AB; ed. E. Diehl (1903–06), II, 122, lines 13–17.

[32] *Theophrastus: Metaphysics*, with translation, commentary and introduction by W. D. Ross and F. H. Fobes (1929).

[33] *Metaph.* XII, 7, 1072a, 26.

[34] *Op. cit.*, 5a, 24 and 28, and 6a, 9. Cf. ἐφατόν in *Phys.* I, 9, 192a, 17, used as the equivalent of ὀρεκτικόν in *Metaph.* XII, 7, 1072a, 26. Cf. also the use of ἐφίενται and ὄρεξις in *Eth. Eud.* I, 8, 1218a, 24–28, quoted *infra*, at note 53.

desire (ἔφεσις), especially that towards what is best, involves a soul, then unless one is speaking by way of similitude, the things that move must be possessed of a soul; but ...,"[35] and here follow the arguments against it. Later, confining himself to the outermost sphere, he says, "One might perhaps raise the question, with reference to the first heaven itself, whether its rotation is of its essence (τῆς οὐσίας) ... or whether ... its rotation depends on a desire and appetence (ἐφέσει καὶ ὀρέξει) ... unless indeed appetence (τὸ ὀρέγεσθαι) is congenital (σύμφυτον) with the first heaven."[36] Here then he suggests that, if the rotation of the outermost sphere is not "of its essence," that is to say, is not by nature, but by "desire and appetence," that is to say, by a soul, then the desire or appetence or soul may be assumed to be "congenital" with the body of that sphere. This suggestion is a direct anticipation of the view of Alexander, to which we have briefly referred *supra*[37] and which we shall discuss more fully later.[38]

The next interpretation of Aristotle's attributing souls to the spheres occurs in pseudo-Plutarch's *De Placitis Philosophorum*, which, according to Diels,[39] is based upon a work by a certain Aëtius, who flourished at about A.D. 100. According to this work, Aristotle held that "the circumambient spheres are animate and living beings"[40] and "he calls the stars animals."[41]

Then comes Alexander of Aphrodisias, who in his commentary on the *Metaphysics*, like Theophrastus in his lost treatise *On the Heaven* quoted *supra*, agrees that the heaven is animate, on the grounds, first, that the heaven is the best of all bodies, seeing that the eternal is better than the non-eternal, and, second, that the best of all bodies must be animate, seeing that an animate body is better than an inanimate one.[42]

The attribution of souls to the celestial bodies is also maintained by some Greek Church Fathers who flourished prior to Simplicius, such as Tatian[43] and Origen,[44] who probably reflected interpretations of Aristotle.

With the adoption of those statements in Aristotle which ascribe a soul to the heavens as representing the philosopher's true doctrine, there arose the question of explaining the other passages in which he describes the rotation of the heaven as being by nature. On this, two views were put forward.

First, there was the view of Alexander as quoted by Simplicius in his commentary on the *Physics* from Alexander's lost commentary on Book II of *De Caelo*, which reads as follows: "We shall endeavor to show that in the divine body nature is not one thing and soul another thing, but the soul in it is nature as is the heaviness of the earth and the lightness of the fire."[45] Again, in his commentary on *De Caelo*, without mentioning the source, Simplicius cites

[35] *Op. cit.*, 5a, 28–5b, 2 ff.
[36] *Ibid.*, 6a, 5–10; cf. use of the term σύμφυτον in quotation *supra*, at note 17.
[37] Cf. *supra*, at note 18.
[38] Cf. *infra*, at notes 45–64.
[39] H. Diels, *Doxographi Graeci*,[2] Prolegomena.
[40] *Ibid.* II, 3, 4, p. 330a, lines 9–10.
[41] *Ibid.* V, 20, 1, p. 432a, lines 6–7.
[42] *Alexander in Metaphysica* XII, 6, ed. M. Hayduck (1891), p. 686, lines 11–14.
[43] *Oratio ad Graecos*, Cap. 12.
[44] *De Principiis* I, 7, 2–3.
[45] *Simplicius in Physica* VIII, 4, ed. H. Diels (1895), p. 1219, lines 3–5.

Alexander as maintaining that "nature there [in the heaven] is the same as soul."[46] Speaking for himself, in a work which is not extant in the original Greek but exists in an Arabic translation,[47] Alexander starts out by stating that "every natural body has in its essence a principle of motion," which principle of motion he calls "nature" and then adds that everything that is moved essentially by nature, "whether animate (*mutanaffis* = ἔμψυχος) or inanimate is moved by an *ishtiyāq* for something."[48] The same view is later extended by him to the celestial spheres.[49]

The first thing we have to clear up in this passage is to find out what Greek term lies behind the Arabic term *ishtiyāq*, to which the motion of both animate and inanimate things is ascribed. The term *ishtiyāq* ordinarily means "desire" and hence one would be tempted to assume that it renders the Greek ὄρεξις or ἐπιθυμία for these two terms are most often used by Aristotle as sources of motion. But a later statement in the text excludes either of these possibilities. This later statement says that among bodies which are moved by *ishtiyāq* some are more perfect and possess 'a soul,' but in their case the *ishtiyāq* by which their motion is effected "is accompanied by a certain *shahwah*, and of this *shahwah* one aspect is called 'desire' (*shauq*), another is called anger (*ghaḍab*), and still another is called will (*irādah*)."[50] Now the *shahwah* which in Alexander's statement is subdivided into "desire," "anger," and "will" quite evidently reflects Aristotle's statement that "appetence (ὄρεξις) is desire (ἐπιθυμία), anger (θυμός), and will (βούλησις)."[51] Since, according to these two parallel statements, *shahwah* in the passage of Alexander stands for the Greek ὄρεξις,[52] the term *ishtiyāq*, which is said by Alexander to be accompanied by a certain *shahwah*, of which one element is *shauq*, can be neither the Greek ὄρεξις nor the Greek ἐπιθυμία. Moreover, both ὄρεξις and ἐπιθυμία are always used by Aristotle as faculties of the soul and are always applied by him only to animate beings and never, as in Alexander here, to inanimate beings. With regard to ὄρεξις, there is a passage in which Aristotle explicitly denies that it is applicable to inanimate beings. In that passage, alluding to a view according to which numbers have a desire (ἐφίενται) for unity, Aristotle argues that "no-one says distinctly how they desire," and concludes with the challenge: "And how can one suppose that there is appetence (ὄρεξις) where there is no life?"[53]

[46] *Simplicius in De Caelo* II, 2, p. 387, line 14.

[47] *Fī Mabādi' al-Kull in Aristū 'inda al-'Arab*, ed. A. Badawi (1947), pp. 253–277; cf. S. Pines, "A Refutation of Galen by Alexander of Aphrodisias and the Theory of Motion," *Isis*, 52 (March 1961), pp. 21–54, of which pp. 43–45 deal with the texts quoted here.

[48] *Ibid.*, p. 253, lines 20–23.

[49] Cf. *infra*, at notes 58–59.

[50] *Op. cit.*, p. 204, lines 9–12.

[51] *De Anima* II, 2, 414b, 2.

[52] In the Arabic translation of *De Anima*, ed. A. Badawi (1954), both ὄρεξις and ἐπιθυμία in this statement are translated by *shahwah*. Similarly in *De Anima* II, 2, 414b, 5–6, the statement "this [ἐπιθυμία] is an ὄρεξις for what is pleasurable" is translated into Arabic by "*shahwah* is a *shahwah* for a pleasurable thing." In *De Anima* III, 10, 333a, 25–26, however, the statement that "ἐπιθυμία is a species of ὄρεξις" is translated by "*shahwah* is a species of *shauq*." So also in *De Anima* III, 9, 432b, 3, τὸ ὀρεκτικόν is translated by *al-shauq*. Evidently there was no consistency in the Arabic translation of these Greek terms.

[53] *Eth. Eud.* I, 8, 1218a, 24–28.

Hence evidently the Arabic *ishtiyāq* does not stand here for either of these two Greek terms. What Greek term, then, does it stand for?

An answer to this question is to be found in a passage in Aristotle's *Eudemian Ethics*. In that passage, Aristotle first says that "inanimate things," such as "a stone and fire," may be moved "according to nature and their essential impulse (ὁρμὴν)," that is to say, they are moved by nature and impulse, when the stone moves downward and fire upward, and are not compelled by some external force to move in directions opposite to these. Then he says that similarly "animate things" may be moved by their own internal "impulse," that is to say, they are moved by impulse, when they are not compelled to move contrary to it by some external force. But then he draws a distinction between inanimate and animate things. In the case of the natural motion of inanimate things, the principle of their motion is simple: it is the aforesaid "impulse." In the case of animate things, the "impulse" is accompanied either by "appetence" (ὄρεξις) or by "appetence" plus "reason" (λόγος).[54]

In these statements, then, the term ὁρμή is used by Aristotle as the source of motion in both inanimate and animate beings, but in the case of animate beings this ὁρμή is accompanied by ὄρεξις. Consequently, when Alexander, in the Arabic version of his work, says that both inanimate and animate beings are moved by *ishtiyāq* and that in the case of animate beings *ishtiyāq* is accompanied by a certain *shahwah*, which we have shown to mean ὄρεξις, the term *ishtiyāq* quite evidently stands for the Greek ὁρμή. Alexander himself, it may be added, explains his use of the Greek term underlying the Arabic *ishtiyāq* in the following statement: "This *ishtiyāq* [in the case of the elements] which proceeds from their natural predisposition (*tahayyu'*) is their inclination (*mayl*) for a thing which is, as it were, suited for them," and that suitable thing for which the elements have an inclination, he goes on to say, is the "natural place which is appropriate" to every one of the four elements.[55] This reflects a passage in Aristotle where, after stating that "we call things heavy and light because they have the power of being moved naturally in a certain way," that is to say, either downward or upward, he adds: "The activities corresponding to these powers have not been given any name, unless it is thought that inclination (ῥοπὴν) is such a name."[56] If we are right in our assumption that *ishtiyāq* is the Greek ὁρμή, then Alexander's explanation of it by ῥοπή would mean that he used these two terms in the same sense. It may be remarked that in the Latin translation of Aristotle both these terms are translated by *impetus*.[57]

Alexander goes on to say that the celestial sphere, because it is the most perfect of bodies, must be animate (*mutanaffisah*),[58] and as such it is moved by a certain "appetence" (*shahwah* = ὄρεξις).[59] But then he proceeds to point out some differences between sublunar animate bodies and the celestial sphere.

[54] *Ibid.* II, 8, 1224a, 16–30.
[55] *Op. cit.*, p. 254, lines 6–7.
[56] *De Caelo* IV, 1, 307b, 31–33.
[57] See Index volume to Didot's edition of Aristotle, s.v. "Impetus" (p. 389a).
[58] *Op. cit.*, p. 254, lines 13–16.
[59] *Ibid.*, line 19.

First, in the case of sublunar animate bodies, as he has said, the "appetence" results from "desire" and "anger," whereas in the case of the celestial sphere, "desire and anger are separated from the nature of that body."[60] Second, while it is true that some of the sublunar animate bodies enjoy "free choice" (*iḫtiyār*), their free choice results from "anger" and "desire," whereas the free choice of the celestial sphere results from "the love of the good."[61] Finally, he says, the circular motion of the celestial body is indeed "by a nature which is peculiar to it,"[62] but "it must not be believed that its nature is something other than soul, and so also it must not be believed, with regard to composite living bodies, that their nature, by reason of its being that of living creatures, is something other than soul,"[63] adding, however, that, while in composite animate bodies there is a bodily nature which is different from the nature which is their soul, in the celestial sphere there is only one nature, and that nature is its soul.[64]

Thus Alexander does not deny that the celestial sphere possesses a soul; he contends only that "soul," both in the case of the celestial spheres and in the case of sublunar animate beings, is just a name given to the natures peculiar to them, and it is by these peculiar natures of theirs that they perform their peculiar kinds of motion, which differ from the kinds of motion performed by the natures peculiar to the four elements.

Alexander is opposed by Simplicius. Asserting that soul and nature are not the same, and further maintaining that Aristotle in his apparently contradictory statement really meant that the heaven is moved both by a soul and by nature, he goes on to say: "If somebody asks, how, on the one hand, nature moves the heaven and how, on the other, soul moves it, it is not to be said as Alexander has said, namely, that nature there is the same as soul. For how can it be the same, when nature is a passive power of that which is moved, existing in a subject which is moved, whereas soul is that which causes motion from without (ἔξωθεν). It is, therefore, not to be said that soul and nature in the heaven are the same but rather that the same motion is moved according to both [soul and nature], that is to say, by soul as by something which causes motion from without (ἔξωθεν) and by nature as by a principle inherent in that which is moved."[65] The term "from without" (ἔξωθεν), by which he describes here the motion caused by a soul, should not, in my opinion, be taken literally, for Aristotle quite definitely describes the soul of animals as a "principle of motion in themselves."[66] What Simplicius means by this description is that the soul as the mover of the heaven is something distinct from, and other than, the body of the heaven, in which respect it differs from "nature" which is not anything distinct from, and other than, the body of the heaven. Thus also Aristotle, after describing the soul as a principle of motion in the animal itself, goes on to say that the soul is distinct and different from the body of the animal,

[60] *Ibid.*, lines 19–20.
[61] *Ibid.*, p. 255, lines 1–5.
[62] *Ibid.*, lines 17–18.
[63] *Ibid.*, lines 20–23.
[64] *Ibid.*, p. 255, line 22–p. 256, line 8.
[65] *Simplicius in De Caelo* II, 2, p. 387, lines 12–19.
[66] *Phys.* VIII, 4, 254b, 16.

which he expresses by saying that in animals "that which causes motion [namely, the soul] is separate (διῃρημένον) from that which suffers motion [namely, the body]."[67]

Further explanation of soul and nature as being the joint movers of the heaven is to be found in a passage in which Simplicius says: "The natural and animate whole is appropriately moved by the soul through nature as a medium, for nature is a certain life, an aptitude and disposition existing in its subject, the body, so as to enable bodies to be moved by a soul, and through itself as a medium nature conveys the motive power of the soul to the body."[68]

Still further in the same passage he tries to justify Aristotle's description of the motion of the heaven as being natural, despite its being moved by a soul, by referring to Aristotle's use of the term "natural" in two passages of his writings. First, he says, his own interpretation of the term "natural" as meaning that the soul of the heaven uses the nature of its body as a medium "is in conformity, I think, with the teaching of Aristotle, for he says that soul is the entelechy of a natural body."[69] Second, he says, the term "natural" may have been used by Aristotle "in the sense of its having a natural and not a violent motion and, according to it, an aptitude to be moved,"[70] evidently expecting us to add that this is in conformity with Aristotle's use of the term "natural (φύσει) as the opposite of "violent (βίᾳ) and unnatural (παρὰ φύσιν).[71]

This then is Simplicius' explanation of how Aristotle could describe the motion of the heaven as being both by nature and by soul. Sometimes, however, Simplicius, like Alexander as well as Aristotle himself, uses the term "inclination" as the equivalent of the term "nature." Thus he says: "If, therefore, velocity is produced through natural inclinations (φυσικὰς ῥοπάς) and some things are moved upward, on account of having more levity, and others downward, in consequence of having more gravity, it is evident that gravity and levity existing inwardly, as natural powers (φυσικαὶ δυνάμεις), will receive an infinite addition."[72] Here, then, the expression "natural inclinations" is used as the equivalent of the expression "natural powers" as the cause of the upward and downward motions of the elements.

But here a new question came up. Soul in Aristotle is a general term which includes three kinds of soul, with their respective faculties: (1) the vegetable soul, with its faculties of nutrition and reproduction; (2) the animal soul, with its five external senses as well as imagination and memory; (3) the human soul, distinguished by its faculty of reason. When, therefore, the commentators decided that the celestial bodies were, according to Aristotle, moved by souls, they began to play a sort of charade and asked themselves, what kind of a besouled body is a celestial body? Is it a vegetable? Is it an animal? Is it a human being? In answer to this question, they all agreed that it is not a vege-

[67] *Ibid.*, 31–32.
[68] *Simplicius in De Caelo* II, 1, p. 381, lines 31–35.
[69] *Ibid.*, ll. 35–36; cf. *De Anima* II, 1, 412b, 5–6.
[70] *Ibid.*, p. 382, lines 11–13.
[71] *Phys.* VIII, 4, 254b, 13–14.
[72] *Simplicius in De Caelo* I, 8, p. 263, lines 18–21.

table, for, as Alexander says, the soul of the sphere has no nutritive faculty,[73] and to this there is no opposition. The reason for this is to be found in Aristotle's view that one of the functions of the nutritive faculty is the reproduction of the species[74] and, in fact, he even says that the nutritive faculty is the same as the reproductive faculty.[75] But this faculty of nutrition and reproduction, Aristotle further says, exists in living beings for a definite purpose, its purpose being to preserve the existence of the various species of living beings, seeing that as individuals they are all subject to extinction.[76] Since, therefore, the nutritive faculty is needed only to preserve the species of beings which individually have no eternal existence, it is not needed in celestial bodies, which, according to Aristotle, are individually eternal.[77]

When it came, however, to the question whether the celestial bodies were animals endowed with sensation, two opposite views were expressed by the early Greek commentators and these two views found their partisans among the later Byzantine commentators.

These two views among the early Greek commentators are reflected in two readings in pseudo-Plutarch's *De Placitis Philosophorum*. According to one reading, adopted by Diels on the basis of the testimonia of Eusebius and Cyril of Alexandria, Aristotle is reported to have held the following view: "The whole world is not besouled in every part of it, nor is it rational (λογικόν) and intellectual (νοερόν), nor is it governed by providence in every part of it. Of all of these, however, the heavens are made partakers."[78] From this reading in the first part of the passage, it is quite evident that the heavens are assumed to be partakers only of the "rational" or "intellectual" faculty of the soul. According to some manuscripts, however, and according to Galen, the reading in the first part of the passage is "nor is it sensitive, rational, and intellectual," which makes the heavens partakers also of sensation. Thus from the Doxography of Aëtius we gather that there may have been two interpretations of Aristotle on this point at about the end of the first century.

The same two interpretations of Aristotle are to be found also among his commentators of the early part of the second century, Plutarch of Chaeronea (*ca.* A.D. 46–120) and Alexander of Aphrodisias (fl. 198–211).

Plutarch of Chaeronea, in a passage which is not written in the form of a commentary on Aristotle but which was quite evidently meant to reproduce what was believed to be the view of Aristotle, speaks of the senses of "seeing and hearing" as celestial and divine," which would imply that he attributed to the celestial bodies the sense of seeing and of hearing.[79]

Alexander of Aphrodisias, however, is quoted by Simplicius as maintaining that the soul of heaven has no sensitive faculty any more than it has a nutritive faculty and, inasmuch as any being, if it is to be called animal, must have

[73] *Ibid.* II, 8, p. 463, line 5.
[74] *De Anima* II, 4, 415a, 25–26.
[75] *Ibid.*, 416a, 19.
[76] *Ibid.*, 415b, 1–7.
[77] *De Caelo* I, 3, 270b, 1 ff.
[78] H. Diels, *Doxographi Graeci*², II, 3, p. 330, lines 5–8.
[79] Plutarch, *De Musica*, 25.

sensation, he concludes, that the heaven and the stars, though called by Aristotle "animate beings" (ὄντα ἔμψυχα), cannot be called living beings (ζῷα) except in an equivocal sense,[80] that is to say, they are said to possess a soul only in an equivocal sense.

This interpretation of Aristotle is unfolded by Alexander more fully in a comment on a passage of Aristotle's *De Anima*, which is quoted from his lost commentary on that work by Simplicius and Philoponus.[81]

The Aristotelian passage in question consists of four statements:

A. "Sensation is not necessarily present in all living beings" (*De Anima* III, 12, 434a, 22-23), for, as it goes on to say, plants have nutrition but have no sensation.

B. "It is not possible that a body capable of motion but produced by generation should have a soul and a discriminating intelligence without also having sensation" (434b, 2-3), that is to say, no human being can be without sensation.

C. "Nor yet even not produced by generation" (ἀλλὰ μὴν οὐδὲ ἀγένητον) (434b, 4-5), that is to say, neither a heavenly body which is capable of motion but is eternal.

D. This is immediately followed by a statement, which Alexander read as follows: "For why should it have (διὰ τί γὰρ ἕξει)? Presumably it would be better so either for the soul or for the body. But clearly it would not be better for either, for the soul will not on account of that be better able to think and the body will be no better off" (434b, 5-8).

Now Alexander takes statement *D* to refer, not to statement *C*, which immediately precedes it, but rather to statement *B*, and accordingly interprets the passage as follows: *A* Sensation is not present in plants, *C* nor is it present in the celestial bodies, *D* for why should the celestial bodies have sensation, when it would not do any good either to their souls or to their bodies, for sensation, according to Aristotle, is needed by animals either for the sake of their being or for the sake of their well-being,[82] but the celestial bodies are described by Aristotle as "eternal," as "not being subject to increase and diminution," as "not growing old," as "unchanging in quality," and as "impassive,"[83] and consequently there is nothing which is needed by them either for their being or for their well-being.

A similar division of opinion is to be found also among the Byzantine commentators, such as Plutarch of Athens, Philoponus, Simplicius, Olympiodorus, and Themistius.

Plutarch of Athens, as quoted by both Philoponus[84] and Simplicius[85] from his lost commentary on Aristotle's *De Anima*, differs from Alexander in his

[80] *Simplicius in De Caelo* II, 8, p. 463, lines 3-6. See explanation of this expression *infra*, at note 153.

[81] *Simplicius in De Anima* III, 12, ed. M. Hayduck (1882), pp. 319-321; *Philoponus in De Anima* III, 12, ed. M. Hayduck (1897), pp. 395-396; cf. Fr. Ad. Trendelenburg (1833), Ad. Torstrik (1862), E. Wallace (1882), G. Rodier (1900), and R. D. Hicks (1907) in their commentaries on *De Anima*, dealing with III, 12, 434b, 9-24.

[82] *De Anima* III, 12, 434b, 9-26.

[83] *De Caelo* I, 3, 270b, 1-2.

[84] *Philoponus in De Anima* III, 12, p. 599, line 35; cf. Zeller, *Phil. d. Griech.*, III, 2^4, p. 809, note 2.

[85] *Simplicius in De Anima* III, 12, p. 320, line 29.

interpretation of the passage in *De Anima* II, 12, which we have divided into four statements. He takes statement *D* in that passage to refer to statement *C* which immediately precedes it, but instead of Alexander's reading "For why should it have?", he has the reading "For why should it not have (διὰ τί γὰρ οὐχ ἕξει)?" Accordingly, he interprets statements *B*, *C*, and *D* as follows: *B* Human beings, because they are endowed with reason, cannot be without sensation, *C* nor can the celestial bodies be without sensation, *D* for why should the celestial bodies be without sensation, when the absence of sensation would not add anything that is good either for their soul or their body. He thus finds that Aristotle attributes sensation to the celestial bodies.

Philoponus follows Alexander in interpreting the passage in *De Anima* III, 12, as meaning that sensation is not required by the celestial bodies.[86]

Simplicius in his commentary on *De Anima*[87] interprets the passage quoted above like neither Alexander nor Plutarch of Athens. The passage, to him, does not contain any reference to the celestial bodies. Omitting statement *C*, namely, "Nor yet even not produced by generation," altogether, but following Alexander in the reading of the beginning of statement *D*, namely, "For why should it have?", he interprets the whole statement as follows: For why should a human being have a soul and a discriminating intelligence without also having sensation, when his not having sensation would not add anything that is good either for his soul or for his body? Here, then, Simplicius is opposed to an interpretation which would show that Aristotle attributed sensation to the celestial bodies.

However, elsewhere in his commentary on Aristotle's *De Anima*, Simplicius puts an interpretation upon a vague passage which enables him to infer that Aristotle did attribute sensation to the celestial bodies. In that passage, Aristotle begins with the statement that in plants there is only nutrition and that in animals there is also sensation, appetite, and locomotion, and then goes on to say, "But others, as, for instance, men or other beings similar to or superior to them, if there be any such, possess also the thinking faculty and intellect."[88] Commenting upon this statement, Simplicius says; "By the expression 'superior to them,' Aristotle means demons ... as well as the celestial bodies, who have both sensation and appetence, which are not passive or roused by objects perceived as they strike the senses from without, but know and arrange all objects as something perceived from within."[89] It may be remarked that Simplicius' inclusion of the celestial bodies among those beings which are superior to men rests upon Aristotle's statement that "there are many other things more godlike in their nature than man, as, most obviously, the elements of which the cosmos is composed,"[90] by which elements of which the cosmos is composed are meant the celestial bodies.[91]

[86] *Philoponus in De Anima* III, 12, p. 595, line 39–p. 596, line 12. Cf. Hicks (p. 578) on *De Anima* 434b, 5.

[87] *Simplicius in De Anima* III, 12, p. 320, lines 9ff.

[88] *De Anima* II, 3, 414b, 18–19.

[89] *Simplicius in De Anima* II, 3, p. 106, lines 25–29.

[90] *Eth. Nic.* VI, 7, 1141a, 34–1141b, 2.

[91] Cf. J. A. Stewart, *Notes on the Nichomachean Ethics* (1892), *ad loc.* (II, p. 58).

In his comment on this passage, then, Simplicius, by taking the beings superior to men to include the celestial bodies, infers that Aristotle attributed to them sensation, though a sensation which is peculiar to themselves and is unlike that of other living bodies.

In still another place, in his commentary on *De Caelo*, Simplicius says, "It is to be wondered that the divine [celestial body] should be perceived by the senses and should be touched, as Alexander admits it to be, and yet should have no sensation. Is it because it is better for bodies not to have sense-perception? But sense-perception is found to belong to the lowest and vilest of animate (ἀψύχοις *sic*!) bodies. Perhaps, therefore, one is to deny [to the celestial bodies] the material and especially passive senses, namely, smell and taste, but to attribute to them the most accurate senses, for, touching each other, the celestial bodies do not touch without sensation, and they see all and hear all."[92] Recalling to our mind that Alexander in his comment on the passage in *De Anima* quoted *supra* tries to show that celestial bodies have no sensation on the ground that neither the soul nor the body of celestial bodies would be better off by the possession of sensation, Simplicius' argument to the effect that Alexander's denial of sensation implies that "it is better for bodies not to have sense-perception," would seem to be directed against this particular interpretation of Alexander's. Simplicius seems to challenge Alexander as follows: You argue that the celestial bodies need no sensation, because sensation is needed either for the being or the well-being of animals, whereas the celestial bodies need nothing either for their being or for their well-being; I argue that the celestial bodies have sensation, because those beings which possess sensation are better than those which do not possess sensation and the celestial bodies are the best of all beings.

A similar attribution to the celestial bodies of some, but not all, of the five senses is to be found in Olympiodorus, but the senses attributed by him to the celestial bodies are somewhat different from those attributed to them by Simplicius. In his commentary on Plato's *Phaedo*, after quoting Proclus as saying that the heavens have only the senses of seeing and hearing, Olympiodorus adds that this is also the view of Aristotle, giving the following explanation: "for of the senses they have only those which contribute to well-being (τὸ εὖ εἶναι), but not those which contribute to being (τὸ εἶναι)."[93]

Thus, according to Simplicius in one of his statements, Aristotle attributes to the celestial bodies the sense of touch, seeing, and hearing, which three senses he calls the most accurate, in contrast to smell and taste, which he describes as "material" and "passive"; whereas according to Olympiodorus, Aristotle attributes to them the senses of seeing and hearing, which he describes as contributing to "well-being," in contrast to smell and taste and touch, which are described as contributing to "being." Neither of these two divisions of the five senses corresponds to any of the divisions made by Aristotle himself.

[92] *Simplicius in De Caelo* II, 9, p. 463, lines 6–12.

[93] *Olympiodori philosophi in Platonis Phaedonem commentaria*, ed. William Norvin (1913), p. 26, lines 22–27, quoted in *Aristolis Fragmenta*, ed. Didot, p. 38, § 26 (48); ed. Bekker, p. 1481, § 39. Cf. G. Rodier's note on *De Anima* III, 12, 434b, 3 (II, p. 568).

In one place, only touch is described by him as being "indispensable to the being (εἶναι) of an animal"; whereas all the other senses are only for the sake of "its well-being (τοῦ εὖ)."[94] In another place, Aristotle speaks of touch and taste as senses which are "necessary for the animal,"[95] that is to say, for the sake of its being, whereas the other three senses are "for the sake of the well-being" of the animal.[96] In still another place, Aristotle speaks of "smelling, hearing, seeing" as existing both "for the sake of preservation" (σωτηρίας ἕνεκεν),[97] that is, "for the sake of being," and "for the sake of well-being" (τοῦ εὖ ἕνεκα).[98] Nowhere in Aristotle is there a distinction like that given by Simplicius, Proclus, and Olympiodorus. However, a distinction like that given here by Proclus and Olympiodorus is found twice in the work of Philo, who quotes it in the name of those whom he calls "the champions of the senses." Leaving out the sense of touch, because, as he says, it is common to the other four senses, he says of sight and hearing that they "are philosophic, and through them a good life is attained by us," and further that they "help the immortal mind"[99] and are the causes "of living well (καλῶς ζῆν)";[100] whereas of the other two senses, smell and taste, he says that they are "non-philosophic . . . and have been created only for living"[101] or are only "causes of living."[102]

Finally, among the Byzantines there was Themistius, who followed Alexander in ascribing to Aristotle the denial of sensation to the celestial bodies, stating that "the two extreme types of living beings, namely, plants and stars, are bereft of sensation, the former because they are not good enough for that faculty; the latter because they are too good for it."[103]

While all these Byzantine commentators as well as their predecessors differed among themselves as to whether the celestial bodies possessed a sensitive soul, they all agreed that they possessed a rational soul. Aëtius, as we have seen, while denying them sensation, endows them with reason and intelligence. Alexander, who identifies soul with nature, denies them only nutrition and sensation. Simplicius endows them not only with a rational but also with a sensitive faculty. Philoponus who, while speaking for himself as a Christian, denies them a rational soul; speaking as a commentator of Aristotle, denies them on behalf of Aristotle only a sensitive faculty.

II

These were the interpretations of Aristotle's conception of the inner movers of the celestial bodies among his Greek commentators in the sixth century, a century before the rise of Islam. There was, on the one hand, the interpretation

[94] *De Anima* III, 13, 435b, 17–25.
[95] *Ibid.* III, 12, 434b, 22–23.
[96] *Ibid.*, 24.
[97] *De Sensu* 1, 436b, 20.
[98] *Ibid.*, 437a, 1.
[99] *Qu. in Gen.* III, 5, ed. Ralph Marcus (1953), I, p. 187.
[100] *De Specialibus Legibus* I, 62, 337.
[101] *Qu. in Gen.* III, 5.
[102] *Spec.* I, 62, 337.
[103] *Themistius in De Anima*, ed. R. Heinze (1899), p. 123, lines 29–31.

of Alexander which held that the celestial bodies were moved by their nature, also called soul, and that soul, which was the same as nature, was without sensation, though having a rational appetite; on the other hand, there was the Simplician interpretation which held that the celestial bodies were moved both by their nature and by a soul and that the soul, which was not the same as the nature, had sensation. About the middle of the eighth century translations from the Greek into Arabic began. In the course of time all the important Greek texts dealing with the inner movers of the spheres were available in Arabic: Aristotle's own works, Pseudo-Plutarch's *De Placitis Philosophorum*, Alexander's commentary on the *Metaphysics*, Themistius' commentaries on *De Caelo*, *De Anima*, and *Metaphysics*, Simplicius' and Philoponus' commentaries on *De Anima*. No mention is made by bibliographers of an Arabic translation of Olympiodorus' commentary on the *Phaedo* or of Simplicius' commentary on *De Caelo*, but this does not prove that no such translation existed or that the Arabic philosophers had no knowledge of the contents of these commentaries. Ibn Ḥazm, as we shall see, knew of the interpretation of Aristotle contained in them.

Through these translations the problem of the inner movers of the spheres was introduced into Arabic philosophy, where it was made into a subject of debate, which became involved in many other problems. I shall try to isolate the problem of the soul of the spheres from all the other problems to which it became related, and of this isolated problem I shall consider only two phases, namely, whether the soul is the same as nature or not, and whether it has sensation or not; furthermore, I shall deal with these two phases only insofar as they bear a relation to the Byzantine Greek commentaries. As protagonists of this problem in Arabic philosophy I shall take Avicenna and Averroes, but in the course of the discussion I shall introduce the views of other philosophers.

Avicenna begins his discussion of the inner mover, or, as he calls it, the "proximate agent" of the circular motion of the heavens with the statement that it is a "soul," so that the heaven is a living being (*ḥaywān* = ζῶον),[104] and proceeds to argue how that proximate agent cannot be a "nature."[105] This quite evidently reflects the view of Simplicius. Like Simplicius, too, he notes the passages in which Aristotle speaks of the motion of the celestial bodies as being by nature. The explanations he offers are again like those of Simplicius. First, their motion is described as being by nature in the sense that it is "not contrary to the necessitation of another nature inherent in their body," so that, while the soul which moves the spheres is not to be described as a "natural power," it is still to be described as a "natural cause."[106] Second, "every [motive] power causes motion through the medium of a certain inclination (*mayl* = ῥοπή)," [107] which inclination "is undoubtedly other than the motion and also other than the power which causes the motion,"[108] and this is true also of the circular

[104] *Al-Najāt* (A. H. 1331), p. 422, lines 7–9.
[105] *Ibid.*, p. 423, lines 3–12.
[106] *Ibid.*, p. 423, lines 15–18; cf. Simplicius *supra*, at note 70.
[107] *Ibid.*, p. 424, line 1; cf. Simplicius *supra*, at note 69.
[108] *Ibid.*, lines 3–4.

motion of the celestial bodies, so that in their case also, "the mover constantly produces in the body one inclination after another, and this inclination may very well be called nature, seeing that it is not a soul, nor anything extraneous, nor has it will or choice ... and consequently, if you call that concept of inclination nature, you may then say that the celestial body is moved by nature."[109]

In this passage, Avicenna shows a knowledge of both Alexander and Simplicius. His discussion of "inclination" (*mayl*) is taken directly from Alexander's *Fī Mabādī' al-Kull*, which work he mentions elsewhere by title.[110] His statement that the celestial bodies are moved by a soul as well as by nature, and his two explanations of how they can be described as being moved by nature are exactly like the views of Simplicius.

Avicenna's opinion that the soul and the nature by which the celestial bodies are moved are two different principles is repeatedly opposed by Averroes in his various works. It seems that Aristotle's statement in *De Caelo* II, 2, 285a, 29, that "the heaven is animate (ἔμψυχον)" was in the Arabic version not translated literally *al-samā' mutanaffis* but rather freely *li-samā' nafs*, "to the heaven there is a soul," for in the Latin translation of the Arabic this statement reads *coelum habet animam*.[111] Accordingly, in his *Sermo de Substantia Orbis*, after showing that in the celestial sphere there does not exist the ordinary distinction of matter and form, whence also not the ordinary distinction of soul and body, he says: "The heaven is said to have a soul (*coelum habere animam*) only on account of appetence and locomotion which exist in it. It has appetence, however, only because of its being a celestial body that has life in virtue of its essence and is appetent in virtue of its essence, not because of a power in it which is [part of it and hence] divisible by the division of it.... Similarly, its motion is said to be due to an immaterial principle which is in it [without being part of it], and not to a principle which is in it as part of it. It is in this way that the celestial body is said to be living and intelligent," that is, it is said to be living and intelligent "in virtue of its essence."[112] This means that in the celestial bodies the soul is the same as their essence or nature.

Averroes expresses himself more clearly when he says that "the nature of this [celestial] body is nothing but the nature of the soul which causes motion in place,"[113] and that "the forms of the celestial bodies, and especially the form of the last circumambient [sphere], are each in a certain sense a soul."[114]

Similarly in his Long commentary on the *Metaphysics* he says: "Inasmuch as Aristotle has said that the celestial substances have no matter (*'unṣur*), that

[109] *Ibid.*, lines 5–10.

[110] *Ibid.*, p. 436, lines 10–11. Cf. Maimonides, *Moreh Nebukim* II, 3; M. Steinschneider, *Al-Farabi* (1869), p. 67.

[111] *Averroes in De Caelo* II, Text. 13, *Opera Aristotelis* (Venice, 1574), V, p. 102 B, also quoted in Averroes' comment on it (p. 102 E), though in the course of his discussion he uses for it the term *animatum* (p. 102 F). Elsewhere in *De Caelo* I, 7, 275b, 26 (Text. 72), and II, 9, 291a, 23 (Text. 56), ἔμψυχον is translated *animatum*.

[112] *Sermo de Substantia Orbis*, cap. 1 (*Opera*, IX, p. 5 HI).

[113] *Ibid.*, cap. 2 (p. 6 C).

[114] *Ibid.* (p. 6 FG).

is to say, their bodies are not composed of matter and form but are rather composed of body and an animate (*nafsāniyyah, animata*), intelligent form, not indeed as a living being (*nafs, anima*[*l*]) is an animate (*mutanaffis, animata*) thing, for in the latter case a thing is animated by means of a soul and is alive by means of life, but the celestial substances are animate in virtue of their essence and are alive in virtue of their essence."[115] This reflects the interpretation of Alexander, that the soul of the celestial bodies is identical with their anture.

In the light of all this, when in his *Epitome of the Metaphysics*, Averroes argues for the view that a celestial body must be animate and quotes in support of it Alexander's argument to the effect that "it is impossible that the noblest of animate beings should be inanimate,"[116] the animatedness which he ascribes to the celestial body means that it possesses a soul which is identical with its nature. He restates Alexander's argument more carefully, without mentioning the name of Alexander, in his *Tahāfut al-Tahāfut*. He starts out by saying: "The soul which is in the celestial body has no subsistence (*qiwām*) in this body";[117] in other words, it is not a soul in the same sense as soul of any living being. He then goes on to say: "For the celestial body is not in need of a soul for the continuance of its existence as are the bodies of animals; it is in need of a soul not because it is necessary for its existence to be animate but rather because that which is more excellent must necessarily be in a more excellent condition and to be animate is more excellent than not to be animate."[118] Elsewhere in the same work, drawing upon Ghazali's restatement of Avicenna's view as maintaining that that whose motion is not by nature is to be described as a "voluntary and animate" being, and that the celestial bodies are not to be described as "being moved by will,"[119] Averroes paraphrases it to read that, "since the celestial body is not moved by nature, it is moved by a soul," to which he adds, evidently as an expression of his own view: "or by a power which resembles a soul," from which he infers "that the soul in the celestial bodies is described by the term soul only equivocally."[120] In other words, in contradistinction to Avicenna who, like Simplicius, endows the celestial bodies with a real soul which is different from their nature, Averroes, like Alexander, endows them with a soul which is identical with their nature and which is called soul only in an equivocal sense. As we have seen *supra*, according to Alexander, the celestial bodies, though described as "animate," are to be called "living beings" only in an equivocal sense, that is to say, they are said to possess a soul only in an equivocal sense.[121]

[115] *Averroes*: *tafsir ma ba'd at-tabi'at*, ed. M. Bouyges (1938–1948), VIII, Comm. 12, p. 1077, line 19–p. 1078, line 4. Latin: *Opera*, VIII, Comm. 12, p. 220 GH.

[116] Arabic text in *Averroes*: *Compendio de Metafisica* IV, 6–7, ed. Carlos Quiros Rodriquez (1913). Cf. notes on p. 241 in S. van den Bergh's German translation, *Die Epitome* der *Metaphysik des Averroes* (1924).

[117] *Tahāfut al-Tahāfut* IV, ed. M. Bouyges (1930), § 18, p. 271, lines 7–8.

[118] *Ibid.*, lines 8–11.

[119] *Ibid.*, § 1, p. 470, lines 4–13; cf. Ghazali, *Tahāfut al- Falāsifah* XIV, ed. M. Bouyges (1927), §§ 4–6, p. 240, line 8–p. 241, line 8.

[120] *Ibid.*, p. 473, lines 3–5.

[121] Cf. *supra*, at note 80 and *infra*, at note 153.

While on the question of the relation of soul to nature in the celestical bodies Avicenna sides with Simplicius and Averroes sides with Alexander, on the question whether the celestial bodies are moved by sensation both of them follow Alexander. Avicenna, to be sure, in the principal passages in which he discusses the problem of the souls of the spheres, does not definitely say that the souls have no sensation, but his denial of sensation in those passages may be inferred indirectly from his description of the circular motion of the heaven as caused by its proximate mover, the soul. In that description, he first says that "it is a motion due to an intellectual mobile (*'aqliyyah muntaqilah*) will"[122] and then from the fact that "it is impossible for our intellect to suppose such a mobility without the participation of imagination and sensation,"[123] he infers that "we are not hindered from thinking that in the soul of the heaven there is also an intellectual power which undergoes that intellectual mobility after having based itself on something resembling imagination (*taḫayyul*),"[124] concluding that "the celestial sphere is moved by a soul, the soul being its proximate mover, and this soul is constantly undergoing change with reference to imagination (*taṣawwur*) and will."[125] Thus, like Alexander, he does not include sensation among the faculties of the soul of the heaven mentioned by him, though, without any precedent, he includes among them imagination—a problem which is outside the scope of our present discussion. Averroes, however, explicitly says that the celestial body is in no need of "a sensitive or imaginative soul."[126] He has an interpretation of his own of that passage in *De Anima* III, 12, 434b, 4–8, which, as we have seen, was differently explained by the Greek commentators. According to his interpretation, this passage, by implication, denies the existence of sensation in the celestial bodies.[127]

Besides Avicenna and Averroes, other Arab philosophers also discussed the problem of the souls of the spheres. Alfarabi, before Avicenna, endowed the celestial body with a soul, but that soul had neither sensation nor imagination.[128] Ibn Ḥazm, a younger contemporary of Avicenna, in a passage which betrays a knowledge of either Proclus or Olympiodorus,[129] or perhaps of Simplicius,[130] says, "Some people claim that the spheres and the stars have intelligence and that they only see and hear but do not taste and smell. This claim, however, is devoid of demonstration."[131] Ghazali, who lived after Avicenna but before Averroes, argues that the view that the heavens possess a soul is not impossible on religious grounds but on rational grounds it can be neither refuted nor

[122] *Najāt*, p. 425, line 17; Latin in *Avicenne ... opera* (Venice, 1508), p. 102c, lines 58–59: *potest autem putari quod illa voluntas est intelligibilis mobilis.*

[123] *Ibid.*, p. 427, lines 16–17; Latin, p. 102d, lines 32–33: *intellectioni nostrae non est potentia ponere hanc transmutationem nisi communione imaginationi et sensui.*

[124] *Ibid.*, p. 428, lines 3–4; Latin, p. 102d, lines 37–39: *nos non negamus ibi etiam esse virtutem intelligibilem quae moveatur hac transmutatione intelligibile, sed postquam inititur similitudini imaginationis.*

[125] *Ibid.*, p. 428, lines 7–8; Latin, p. 102c, lines 42–44: *coelum movetur per animam, et anima est proprinquus principium sui motus, sed in illa renovatur imaginatio et voluntas.*

[126] *Sermo de Substantia Orbis*, 2, p. 6 HI.

[127] Averroes, *In III De Anima*, Comm. 61, ed. F. S. Crawford (1953), p. 535.

[128] *Kitāb al-Siyāsāt al-Madaniyyah* (Hyderabad, A. H. 1346), p. 25, lines 12–13.

[129] Cf. *supra*, at note 93.

[130] Cf. *supra*, at note 92.

[131] Ibn Ḥazm, *Fiṣal fī al-Milal* (Cairo, A. H. 1317–27), V, p. 36, lines 17–18.

demonstrated.[132] Avempace, who was a teacher of Averroes, is quoted as saying that "Aristotle was of the opinion that the sphere is moved by its own self," that is, by its own nature.[133]

Among Jewish philosophers writing in Arabic, Isaac Israeli, a contemporary of Alfarabi, in his description of the process of emanation, says that the celestial sphere, in the course of its emanation from the soul, "becomes intellectual and rational[134] and from the context it is clear that it is through a union with the soul that the sphere becomes intellectual and rational. In Plotinus' system of emanation, which is the source of the emanational theory of both Alfarabi and Israeli, the heaven is described as an animate (ἔμψυχον) statue[135] and the world-soul is described as communicating movement and life to the heavens.[136] Saadia, another contemporary of Alfarabi, explicitly denies that the heaven is moved by a soul, but he does so not as a follower of those commentators who interpreted Aristotle in this light, but rather as a critic of Aristotle. Rejecting Aristotle's view that the heaven consists of a fifth element, he maintains that it consists of the element of fire, and argues that fire by its own nature moves circularly; hence he concludes that the circular motion of the heaven is by nature.[137] Of special interest is the view of Judah Halevi. In one place, he asserts that the heaven "is an instrument fully employed by the sole will of God, without the intervention of any intermediate causes."[138] In another place, however, dealiing with the various orders of angels, he says that some angels "are lasting, and are perhaps those spiritual beings of which the philosophers speak, whose view we are obliged neither to refute nor to adopt,"[139] which reminds one of Ghazali's dismissal of the view that the spheres are animate and rational beings as something which can be neither refuted nor demonstrated.[140] Similarly, in still another place, referring to the philosophic view that the celestial spheres are moved by souls and Intelligences and that the Intelligences are identical with the angels of Scripture, Judah Halevi dismisses it as "subleties profitable only for speculation."[141] There is, however, a passage in which he enumerates the gradation of causes, trying to show how they all culminate in God, and among the gradated causes he mentions also "the causes of the celestial spheres."[142] What these causes are may be gathered from two other passages. In one passage he says that "the divine wise will ordains the rotation of the uppermost sphere, which ... causes the other spheres to rotate

[132] Ghazali, *Tahāfut al-Falāsifah* XIV, §§ 1ff., pp. 239ff.; cf. XVI, §§ 1–2, p. 255, line 4–p. 256, line 3.

[133] Quoted by Shem-ṭob Falaquera in his *Moreh ha-Moreh* II, 4, pp. 80–82.

[134] Latin from the Arabic: *Liber Definitionum* in *Omnia Opera Ysaac* (1515), fol. IIIb, line 63: *et factus est per illud intellectualis et rationalis*. Hebrew from the Arabic: *Sefer ha-Gebulim*, ed. H. Hirschfield, in *Festschrift zum achtzigsten Geburtstage Moritz Steinschneider's* (1896), p. 137.

[135] *Enn.* III, 2, 14.

[136] *Ibid.*, V, 1, 2.

[137] *Emunot ve-De'ot* I, 3, 8th Theory of Creation; Arabic text edited by S. Landauer (1881), p. 59, line 2ff.

[138] *Cuzari* IV, 3, ed. H. Hirschfeld (1887), Arabic, p. 234, lines 8–9; Hebrew, p. 235, lines 8–9.

[139] *Ibid.*, p. 244, lines 2–3; p. 245, lines 7–9.

[140] Cf. *supra*, at note 132.

[141] *Op. cit.*, V, 21, p. 354, lines 15–27; p. 355, lines 16–28.

[142] *Ibid.* V, 20, p. 338, lines 11–12; p. 339, line 8.

along with it."[143] The same view, as expressed by him in another passage, states that it is God who causes "the uppermost sphere to carry along all the other spheres."[144] This last statement is almost a verbal reproduction of Aristotle's statement that "the sphere of the fixed stars carries along all the other spheres."[145] Inasmuch as, according to Aristotle, each inner sphere is moved by the sphere of the fixed stars through the intermediacy of the sphere immediately enclosing it, we may conclude that, according to Halevi, while the uppermost sphere is moved directly by God, the inner spheres are moved by the uppermost sphere through the intermediacy of the spheres immediately enclosing them. Abraham Ibn Daud[146] and Maimonides,[147] however, follow Alfarabi and Avicenna in ascribing the motion of the celestial bodies to both souls and Intelligences and in identifying the Intelligences with angels. Opposition to the souls of the spheres is also to be found in post-Maimonidean Hebrew philosophic writings.[148]

About twenty-seven years after the death of Averroes (1198), St. Thomas was born (1225-56). By the time St. Thomas composed the works in which he discusses the inner movers of the spheres, such as his commentary on the *Sentences* of Peter Lombard (1254-56), his *Contra Gentiles* (1264), his *Summa Theologica* (1266-73), and his commentary on *De Caelo* (1272), there were already Latin translations of Arabic works in which this problem was discussed, such as the so-called *Metaphysica* of Avicenna, translated by Dominic Gundisalvi from the *Shifā'* = *Sufficientia*, and Averroes' Long commentary on the *Metaphysics* as well as his *Sermo de Substantia Orbis*. But what is most important, there was a Latin translation, made directly from the Greek, of Simplicius' commentary on *De Caelo*.

References to the discussion of this problem in all of these sources are to be found in St. Thomas' Commentary on *De Caelo*. Mentioning Simplicius by name, he quotes his reference to those "who assumed that Aristotle had said that the heaven was animate not because it had a soul but in the sense that it had a certain life complanted (*complantatam* = σύμφυτον) with the body, so that there is not any soul in it except the nature of such a body."[149] The reference is quite clearly to those philosophers described by Simplicius as being revered by him.[150] Thomas then quotes Simplicius' refutation of this interpretation and approves of this refutation. Accordingly, he concludes, that "the motion of the heaven is both by its nature and by its soul, but by nature indeed as by a second and passive principle, insofar as a body of such a kind is by nature apt to be so moved, but by soul indeed as by a principal and active principle of motion."[151] This is exactly the view of Simplicius.[152]

[143] *Ibid.*, V, 2, p. 296, lines 17–19; p. 297, lines 18–20.
[144] *Ibid.*, II, 6, p. 74, lines 23–27; p. 75, lines 23–27.
[145] *Metaph.* XII, 8, 1073b, 25–26.
[146] *Emunah Ramah* I, 8, pp. 41–43.
[147] *Moreh Nebukim* II, 4.
[148] Cf. my *Crescas Critique of Aristotle* (1929), pp. 77–78, 237, 535–538.
[149] St. Thomas, *In II De Caelo*, Lectio III, 2.
[150] Cf. *supra*, at note 17.
[151] St. Thomas, *loc. cit.*
[152] Cf. *supra*, at notes 65, 68.

He then raises the question whether the soul of the heaven has sensation. Evidently using Simplicius' commentary on the *De Caelo*, he quotes Alexander's view that "in the celestial bodies, if they are animate, the soul has no sensitive power, just as it has no nutritive power, whence they are called living beings only in an equivocal sense, namely, on the ground that they have an intellective soul."[153] He also quotes Simplicius' argument why the celestial bodies should have sensation, concluding that "Simplicius therefore admits that the celestial bodies possess three senses, namely, sight, hearing, and touch, but he excludes from them the two other more material senses, namely, smell and taste."[154]

Between these two views, he favors that of the denial of sensation to the celestial body, for which he finds support in Aristotle's *Metaphysics* XII, 7, 1072a, 26-30 and *De Anima* II, 3, 415a, 8-9. Referring to the passage in *De Anima* III, 12, 434b, 4-8, which, as we have seen, was a subject of various interpretations, he gives preference to the interpretation which makes that passage deny sensation to the celestial bodies, mentioning in this connection Themistius and Averroes.[155]

Having established that, "if the celestial bodies are animate, they have an intellect without sensation," he proceeds to show by argument why they need no imagination, at the end of which he says, "And thereby is excluded the opposite view of Avicenna, who in his *Metaphysics* has shown that the soul of the celestial body must have imagination."[156]

So, following the Alexandrian interpretation of Aristotle as it filtered through the Latin translation of Simplicius' commentary on *De Caelo* and the Latin translations of the works of Avicenna, St. Thomas has arrived at the conclusion that the celestial bodies had a rational soul, free of sensation and imagination. This rational soul of the celestial bodies, though without sensation and imagination, had, like the rational soul of man, which is endowed with sensation and imagination, two functions, that of moving (*movere*) and that of understanding (*intelligere*).[157] But, unlike the human soul, which needs the body both for its moving and for its understanding,[158] the soul of the celestial sphere needed the body only for moving but not for understanding.[159] Accordingly, unlike the human soul which is related to the body as its form,[160] the soul of the celestial body, because it needed the body only for the performance of its function as a mover, "need not be united to the body as its form; but by contact of power (*per contactum virtutis*), as a mover is united to that which moves"[161] or, as he subsequently says, "by contact of some apprehending substance" (*ab aliqua*

[153] St. Thomas, *In II De Caelo*, Lectio XIII, 4. Cf. *supra*, at notes 80, 121.
[154] *Ibid.*
[155] *Ibid.*, Lectio XIII, 5-6; cf. St. Thomas, *In III De Anima*, Lectio XVII, and *supra*, at notes 103, 126, 127.
[156] *Ibid.*, Lectio XIII, 8. The reference to Avicenna's *Metaphysics* is to those passages quoted *supra*, at notes 123-125.
[157] *Sum. Theol.* I, 70, 3c; I, 76, 1c.
[158] *Ibid.*, I, 76, 1c.
[159] *Ibid.*, I, 70, 3c.
[160] *Ibid.*, I, 76, 1c.
[161] *Ibid.*, I, 70, 3c.

substantia apprehendente).[162] To justify his use of the term contact between the mover and object moved, even when the mover is not a body, he quotes Aristotle's statement to the effect that there is contact between the mover and the object moved even when the mover is not a body, except that, when the mover is not a body, the contact is only on the part of the object moved and not on the part of the mover.[163]

But, while in his *Summa Theologica* he maintains that the soul of the celestial body is united to its body not as its form but rather by a contact of power, in his earlier work, the *Contra Gentiles*, he explicitly says that the soul, or intellectual soul or intellectual substance, as he calls it, "is united to the heavenly body as its form."[164] But there is more than that. While in his commentary on *De Caelo*, as well as in his *Contra Gentiles* and *Summa Theologica*, he describes the inner mover of the spheres as a soul, though only an intellectual soul, in his earliest work, the commentary on Peter Lombard's *Sentences*, he explicitly says, concerning the inner movers of the spheres, whom, following Avicenna,[165] he describes as proximate movers, that they are not souls but rather angels.[166] Still, following Aristotle, he believes that, besides inner or proximate movers, the celestial bodies also had outer or remote movers, called by Aristotle immovable substances and by the Arabs Intelligences. Since Thomas called the proximate movers angels, he calls the remote movers also angels. Angels as the movers of the spheres, as we have seen, were postulated by Theodore of Mopsuestia and Cosmas, and this view was rejected by Philoponus.[167] St. Thomas himself quotes St. Augustine as saying that "if the heavenly bodies are animate, their souls belong to the fellowship of angels."[168] This, it may be remarked, is not exactly what St. Augustine says; it is St. Thomas' own interpretation of St. Augustine's statement that "if the luminaries of heaven have spirits which govern them, the question is whether they are vitally inspired by those spirits just as the bodies of animals are animated by souls, or whether those spirits are present in the luminaries without being intermixed with them."[169]

Since both the proximate and the remote movers are called angels by St. Thomas, some differentiation had to be made between them. Accordingly, he calls the former inferior angels and the latter superior angels, and identifies the former with "ministering angels" and the latter with "Cherubim and Seraphim"; and, though he disagrees with Avicenna's identification of angels with Intelligences, he quotes him in support of his view that the remote movers of the spheres are superior angels and the proximate movers are ministering angels. His reference to Avicenna reads, *Unde etiam Avicenna* (tract. X, cap. I) *dicit quod intelligentiae apud Philosophos sunt qui lege vocantur superiores*

[162] *Ibid.*
[163] *Phys.* VIII, 5, 258a, 20–22.
[164] *Cont. Gent.* II, 70.
[165] Cf. *supra*, at notes 104, 125.
[166] St. Thomas, *In II Sent.*, dist. XIV, art. 3c: *Et ideo angelos, qui movent orbes proxime, possumus motores dicere, non formas, vel animas.*
[167] Cf. *supra*, at notes 25–27.
[168] *Sum. Theol.* I, 70, 3c.
[169] *De Genesi ad Litteram* II, xvii, 38 (PL 34, 279–180).

Angeli, ut cherubim et seraphim; animae vero orbium dicunt inferiores, qui dicuntur Angeli ministerii.[170] The Latin translation of the passage in Avicenna's tract. X, cap. I, reads as follows: *In hoc autem primus gradus est angelorum spiritualium spoliatorum, qui vocantur intelligentiae, post haec est ordo angelorum spiritualium qui vocantur animae, et sunt angeli administratores.*[171] From this it can be seen that the statement of St. Thomas is only a paraphrase of the statement of Avicenna, and that, while the proximate movers are called by Avicenna "ministering angels," the terms "cherubim and seraphim" do not occur in Avicenna. They were added by St. Thomas. It is to be noted, however, that Ghazali, in a work unknown to St. Thomas, dealing with the view which St. Thomas ascribes to Avicenna but which Ghazali ascribes to philosophers in general, says,[172] "They assert that the heavenly angels are the souls of the heavens and that the Cherubic angels who are near [to God][173] are the incorporeal Intelligences, which are substances subsisting by themselves."

On the whole, however, the two classes of angels described by St. Thomas as "superior" and "inferior" correspond to the first and the second of the three hierarchies into which, following Dionysius, he classifies the angels.[174] The "Cherubim and Seraphim," which he identifies here with the "superior angels," are two of the three orders of angels, Seraphim, Cherubim, and Thrones, which are placed in the first hierarchy. His assignment to the "inferior angels" of the role of proximate movers of the spheres and his description of them as "ministering angels" correspond to his description elsewhere of the order of Virtues, which is one of the three orders of angels of the second hierarchy, as the order to which "the movement of the heavenly bodies belongs," which are "the highest of God's ministries" and to which "anything else of a universal and primary nature in the fulfillment of the divine ministry" is fittingly to be ascribed.[175]

In the light of his explanation in his commentary on the *Sentences* that by the "inferior angels," who are the proximate movers of the spheres, he means angels of the order of Virtues, we may suggest that when in his *Summa Theologica* he describes the soul, which is the proximate mover of each of the spheres, as being related to the body of the sphere *per contactum virtutis*, the term *virtutis* is not to be translated by "of power" but rather by "of virtue" and is to be taken to refer to an angel of the order of Virtues; likewise, the statement *per contactum ab aliqua substantia apprehendente* should refer to the same kind of angel.

Let us now turn to Kepler, to whom we referred at the beginning of this paper. In his discussion of this problem we note two stages of development.

The first stage is in his *De Rebus Astrologicis*, published in 1602. David Fabricius had asked Kepler what he thought of the Intelligences of the stars.

[170] *In II Sent.*, dist. XIV, art. 3c.

[171] *Avicenne ... opera* (Venice, 1508), fol. 107d, lines 47–51.

[172] Ghazali, *Tahāfut al-Falāsifah* XVI, § 1, p. 255, lines 4–6, quoted in Averroes, *Tahāfut al-Tahāfut* XVI, § 1, p. 494, lines 10–11.

[173] Cf. Koranic expression: "the angels who are near [to God]" (Surah 4: 170).

[174] *Cont. Gent.* III, 80; *Sum. Theol.* I, 108.

[175] *Cont. Gent.* III, 80, *Secunda autem ab operante.*

As for himself, Fabricius says, he thinks the belief in Intelligences as movers of the spheres to be nonsense, though, he adds, "if you say angels and devils, I accept and understand."[176] This quite evidently reflects the view that denied Intelligences as the remote movers of the spheres, but admitted angels.

In his answer, Kepler says: "A certain power presides over the stars, able to grasp (*capax*) the geometry of the globe, capable of causing motion. ... I cannot call it other than Intelligence (*intelligentiam*) or mind (*mentem*)."[177]

In this passage Kepler admits the existence of only one mover of the stars. From the fact that he calls it Intelligence and describes it as presiding over the stars it is quite clear that Kepler's one mover of the stars is what traditionally would be described as an immaterial mover who moves the stars as their final cause. No mention is made by him here of an inner mover of the stars, which would traditionally be called soul. But when he ascribes to this Intelligence the functions of (1) grasping, that is, of understanding, and of (2) causing motion, he ascribes to it exactly the two functions which St. Thomas ascribed to the souls of the spheres. In other words, he ascribes to his one Intelligence the function ascribed by St. Thomas to the souls of the spheres.

The second stage may be seen in Kepler's *De Stella Nova Serpentarii*, published in 1606. "The motive faculties of the stars," he says, "partake to some extent of mind, as though they understand (*intelligant*), imagine (*imaginentur*), and grasp or strive after (*affectent*) their course, not indeed by a certain ratiocination (*ratiocinando*), as we human beings do, but by an inborn power (*ingenita vi*), one which at the very beginning of creation was made instinct with them. So also do the animal faculties of natural things possess a certain understanding (without, to be sure, any ratiocination) of their end, toward which they direct all their actions."[178]

In this passage there is no longer one single separate Intelligence which presides over all the stars and moves them all as their final cause, but rather each of the many stars is moved by an "inborn (*ingenita*) power." The term *ingenita* quite evidently reflects the term σύμφυτον used by those unnamed philosophers revered by Simplicius, which in the Latin version of Simplicius used by St. Thomas was translated, as we have seen, by *complanata*. But while the term *ingenita* used by Kepler in this connection undoubtedly goes back either directly or indirectly to that Greek term in Simplicius, his full description of the "inborn power" bears an eclectic character, being made up of phrases borrowed from Simplicius, perhaps as quoted by St. Thomas, as well as of phrases borrowed from St. Thomas himself and from Avicenna, perhaps, again, as quoted by St. Thomas. In St. Thomas, the heaven is said to be moved by a soul which is "appetent and intelligent (*appetens et intelligens*)";[179] in Avicenna, as quoted by St. Thomas, the soul of the celestial sphere is said to have "an imaginative faculty" (*vim imaginativam*);[180] in those anonymous philosophers

[176] *De Rebus Astrologicis, Opera Omnia* (Frankfurt-am-Main and Erlangen, 1858–71), I, p. 319.
[177] *Ibid.*
[178] *De Stella Nova* XXVIII, *Opera*, II, p. 719.
[179] St. Thomas, *In II De Caelo*, Lectio III, No. 2.
[180] *Ibid.*, Lectio XIII, No. 8.

revered by Simplicius, the celestial sphere is said not to have a "rational soul" (*animam rationalem* = λογικὴν ψυχήν).[181] Combining all these, Kepler, in the passage quoted, first says that the stars, in being moved by that "inborn power," are moved by it "as if they understand (*intelligant*), imagine (*imaginentur*), and grasp or strive after (*affectunt*) their course." This reflects the description of the soul of the sphere found in St. Thomas and in Avicenna. But then, paying homage to those anonymous philosophers revered by Simplicius, who explicitly denied the heaven a "rational soul," he adds: "but not indeed by a certain ratiocination (*ratiocinando*) as human beings do."

Thus, like the unnamed philosophers revered by Simplicius, Kepler starts by describing the inner mover of each star as an "inborn power." But then, this "inborn power" is described like the soul in Avicenna, and partly also like the soul in St. Thomas, as having appetence, imagination, and intelligence. Then, again, like those unnamed revered philosophers, he denies that this intelligence implies a ratiocinative soul.

The same view is restated by Kepler in his *Epitome Astronomiae Copernicanae*, published in 1618-21. Here we have a full-dress discussion of the problem.

He begins by restating the view of Aristotle on the spheres and their movements,[182] and in the course of his restatement he refers to "the later philosophers, whom the Arabs seem to have followed,"[183] and to Avicenna.[184] In his restatement, he mentions Aristotle's distinction between the outer and inner movers of the spheres. The outer movers are said by him to have been described by Aristotle as "separate and immovable principles" or as "separate minds and even as gods,"[185] the latter statement being explained by him elsewhere by a reference to "Book XII of the Metaphysics, Chapter 8," where, he says, Aristotle "built up the most sublime part of his philosophy, that about the gods and the number of them."[186] The Aristotelian inner movers of the spheres are described by him as "motor souls" which are "tightly bound to the spheres and informing them, in order that they might assist the Intelligences somewhat."[187]

In his criticism of Aristotle, his main purpose is to eliminate the outer mover but to retain the inner movers and to define the nature of those inner movers.[188] Inasmuch, however, as Kepler abolished the Aristotelian theory of spheres, which was held by all the Byzantine and mediaeval commentators on Aristotle, the inner movers with which he is concerned are inner movers of the sun, which is said by him to revolve around its own axis, and of the planets, which are said by him to revolve by the rotation of the sun through a certain power emitted by it.[189]

[181] *Ibid.*, Lectio III, No. 2.
[182] *Epitome* IV, ii, 2, *Opera*, VI, p. 339.
[183] *Ibid.*
[184] *Ibid.*, p. 341.
[185] *Ibid.*, p. 339.
[186] *Ibid.* IV, Praefatio, pp. 304-305.
[187] *Ibid.* IV, ii, 2, p. 339.
[188] *Ibid.*, p. 340.
[189] *Ibid.*, pp. 343-344.

In the course of his discussion he indifferently refers to these inner movers by such terms as "angels,"[190] "rational creatures,"[191] "natural powers,"[192] and "souls"[193]—terms which we have already encountered in previous discussions of the subject. But when he comes to formulate his own view on the subject, he first expresses himself as follows: "This rotation comes from one sole motor: whether it be a quality of the body or an offshoot of the soul born with the body."[194] Later he rephrases the same view as follows: "But the celestial movements are not the work of mind but of nature, that is, of the natural powers of the bodies, or else of the soul acting uniformly in accordance with those bodily powers."[195] Of the two alternatives, which he mentions in both these passages, the first reflects the view of Alexander, according to which the inner mover of the celestial body is the nature of the body, which may be called soul; the second reflects the view of Simplicius, according to which the inner mover of the celestial body is both a soul and a nature, both of them coöperating in producing the movement, the former as an active cause and the latter as a passive cause.

Finally, fearing lest his accounting for the movements of the planets by their sole inner movers and his denial of separate Intelligences or minds as outer movers might lead some to suspect him of denying the existence of God, he hastens to declare, at the conclusion of his discussion, that in denying that "the celestial movements are the work of a mind" he does not deny the existence of "Mind the Creator" (*mens creatrix*), for, whether one believes that the planets are moved by a mind or whether one believes that they are moved by "material necessity," one must still believe that it was God by whom the mind or the material necessity was created at the creation of the world.[196]

[190] *Ibid.*, p. 340.
[191] *Ibid.*
[192] *Ibid.*
[193] *Ibid.* IV, ii, 3, p. 343.
[194] *Ibid.* IV, iii, 1, p. 371.
[195] *Ibid.*, p. 372.
[196] *Ibid.*, p. 373.